AUG 16 1990

MEMORANDUM

SUBJECT: Quality Assurance and Quality Control Procedures for Opacity Monitors

FROM: JoAnn Heiman, Chief
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TO: Roger Shigehara, Chief
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Emissions Measurement Branch

We have reviewed the DRAFT "Appendix F - Procedure 2 Quality Assurance Procedures for Opacity Monitors" and EMB's July 9th "Examination of COMS Span Values" and have the following comments and concerns.

For the most part, the Appendix F - Procedure 2 requirements are well written. With a few minor clarifications and editorial corrections, as suggested in the attached hand-marked copy and as summarized below, the procedure should provide the necessary guidance to ensure that opacity monitors provide reliable and accurate data.

We recommend that EMB:

1. Amend 40 C.F.R. 60.7 to include a pre-audit notification requirement to allow the administrator an opportunity to schedule an observer to evaluate the audit procedures. This requirement should also apply to Appendix F gaseous monitor QA/QC audits.

2. Define the terms "quality assurance" and "quality control" in the definitions section of the NSPS General Provisions (40 C.F.R. §60.2), using ORD's February 8, 1990 "Proposed Glossary of Quality Assurance Related Terms" (copy of pertinent sections enclosed). Currently, "quality control" is first referenced in Method 3, Section 4.4; "quality assurance" in Method 6, Section 3.3.6. Neither activity is defined under NSPS.

3. Use consistent definitions throughout the various NSPS monitoring provisions. For example, the Appendix F - Procedure 2 definitions for "upscale calibration value" and "calibration drift" differ from the Performance Specification 1 definitions. To avoid future confusion, the definitions should be made identical, either by correcting PS 1, or by revising Appendix F - Procedure 2.

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4. Most important, develop a consistent approach to selecting calibration drift and audit filter values. Methods outlined in Appendix F - Procedure 2 , 40 C.F.R. 60.13, Performance Specification 1, and the July 9th "Examination of COMS Span Values" memorandum are not consistent and in general produce more questions than answers. To further investigate the inconsistencies, we compiled a list of the current calibration-related requirements.

Selection of Calibration Attenuator Values:

The DRAFT Appendix F - Procedure 2 document specifies that filters in the ranges listed below be used for opacity CEMS performance audits.

Audit Point	-- Audit Filter Range (%Opacity)
1	8-15% (low)
2	20-30% (mid)
3	40-50% (high)

40 C.F.R. Part 60, Appendix B, Performance Specification 1, Section 7.1.2, Table 1, specifies the following filter ranges for the in-factory certification test. Similar filter selection criteria are used by some states during the on-site, off-stack, calibration check.

Span Value (%Opacity)	Low-range	Mid-range	High-range
40.....	11	20	37
50.....	20	37	50
60.....	20	37	50
70.....	20	50	60
80.....	20	50	75
90.....	20	60	80
100.....	20	60	87.5

Lastly, the July 9, 1990, "Examination of COMS Span Values", memorandum describes another approach to calibration filter selection.

Low-level	--	20 to 60 percent of the emission limit
Mid-level	--	80 to 120 percent of the emission limit
High-level	--	150 to 200 percent of the emission limit

After review of the available filter selection options and based on our experience with NSPS COMS, we make the following observations:

First, tie calibration filter selection directly to the opacity limitation. The criteria listed in the July 9th memorandum are reasonable for all audit activities, including the in-factory certification and initial performance test period. Performance Specification 1 and the DRAFT Appendix F - Procedure 2 should be revised to follow similar reasoning.

Second, as an enforcement agency, we are more concerned about COMS linearity and accuracy in the range of "expected" emissions; not over the entire range or span of the monitoring equipment. Region 7's enforcement policy looks only to see if an emission limit is exceeded; placing less emphasis on the magnitude of the exceedances. Filter values tied to the opacity limitation concentrate audit efforts in the range of interest.

Third, all of the opacity monitors evaluated in Region 7 over the years have been designed with a span of 100 percent opacity. We have found in most cases it is not economic to have companies redesign the electronic components to meet the "artificial" span value suggested in the NSPS regulations; a span value set only for the purpose of selecting calibration attenuator values. Under the agency's four year review program, EPA should revisit each NSPS subpart and either exclude the reference to opacity monitor span, or provide a clear explanation that the span value is not a design specification but rather is intended solely to establish the in-factory and field attenuator values.

Overall, a "percent of emission limit" procedure quickly points to potential calibration problems in the range of interest. This approach could be applied not only to traditional SIP and opacity limits but also to NSPS subparts that establish opacity limits based on an initial particulate matter performance test (e.g. Subpart CC Glass Manufacturing facilities). Rather than evaluating the linearity and accuracy over the entire monitor range, plant personnel could concentrate audit efforts in the range of interest.

Calibration Drift:

40 C.F.R. 60.13(d) requires that, "Owners and operators of all continuous emission monitoring systems installed in accordance with the provisions of this part shall check the zero (or low-level value between 0 and 20 percent of span value) and span (50 to 100 percent of span value) calibration drifts at least once daily in accordance with a written procedure".

40 C.F.R. Appendix B. Performance Specification 1. Section 3.3 defines an upscale calibration value attenuator as an optical filter with neutral spectral characteristics, a screen, or other device that produces an opacity value, corrected for path length, that is greater than or equal to the applicable opacity standard but less than or equal to one-half the applicable instrument span value. The upscale calibration value attenuator is used to quantify the calibration drift during the 168-hour conditioning and operational test periods, and is presumably the same filter value used during the daily calibration check.

Similar to the "percent of emission limit" approach suggested in the July 9, 1990 memorandum, establish criteria for the daily calibration drift filter values based on the emission limitation. We recommend that the zero check be done between zero and 20 percent of the applicable opacity limitation (0 to 4% opacity for a 20% opacity limit), and the span drift check between the opacity limitation and two times the opacity limitation (20 to 40% for a 20% opacity limit). This approach would more realistically zero in on potential problems that may occur in the range of interest.

After consideration of the above recommendations, we encourage EMB to move ahead with formal rulemaking to adopt the Appendix F - Procedure 2 requirements. If you have any questions, please contact Jon Knodel, Air Compliance Section, at FTS 276-7622, or John Giar, Air Monitoring Section, at FTS 236-3884.

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